

WHAT IS CLAIMED IS:

1. A reaction solution for use in image recording in with an ink containing a coloring material in a dissolved or dispersed state, the
5 reaction solution destabilizing the dissolved or dispersed state of the coloring material in the ink in contact with the ink,
wherein the reaction solution contains at least a polyvalent metal ion and a nonionic polymer, Ka
10 value of the reaction solution according to the Bristow method is from $1.3 \text{ mL} \cdot \text{m}^{-2} \cdot \text{msec}^{-1/2}$ to $3.0 \text{ mL} \cdot \text{m}^{-2} \cdot \text{msec}^{-1/2}$ inclusive, and viscosity of the reaction solution is from 20 mPa·s to 150 mPa·s inclusive.
- 15 2. The reaction solution according to claim 1, wherein the polyvalent metal ion is contained from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.
- 20 3. The reaction solution according to claim 1, wherein pH of the reaction solution is from 2 to 7 inclusive.
- 25 4. A set of an ink and a reaction solution comprising the ink containing a coloring material in a dissolved or dispersed state, and the reaction solution destabilizing the dissolved or dispersed

state of the coloring material in the ink in contact with the ink,

wherein the reaction solution contains at least a polyvalent metal ion and a nonionic polymer, K_a value of the reaction solution according to the Bristow method is from $1.3 \text{ mL}\cdot\text{m}^{-2}\cdot\text{msec}^{-1/2}$ to $3.0 \text{ mL}\cdot\text{m}^{-2}\cdot\text{msec}^{-1/2}$ inclusive, and viscosity of the reaction solution is from 20 mPa·s to 150 mPa·s inclusive.

5. An inkjet recording apparatus comprising a recording head for discharging an ink containing a coloring material in a dissolved or dispersed state, an ink cartridge having an ink storage unit containing the ink, ink supply means for supplying the ink from the ink cartridge to the recording head, and means for supplying a reaction solution that destabilizes the dissolved or dispersed state of the coloring material in the ink in contact with the ink,

wherein the reaction solution contains at least a polyvalent metal ion and a nonionic polymer, K_a value of the reaction solution according to the Bristow method is from $1.3 \text{ mL}\cdot\text{m}^{-2}\cdot\text{msec}^{-1/2}$ to $3.0 \text{ mL}\cdot\text{m}^{-2}\cdot\text{msec}^{-1/2}$ inclusive, and viscosity of the reaction solution is from 20 mPa·s to 150 mPa·s inclusive.

6. The inkjet recording apparatus according to claim 5, wherein the amount of the polyvalent metal

ion is from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.

7. The inkjet recording apparatus according to
5 claim 5, wherein pH of the reaction solution is from 2 to 7 inclusive.

8. The inkjet recording apparatus according to
claim 5, wherein pH of the reaction solution is lower
10 than that of the ink.

9. The inkjet recording apparatus according to
claim 5, wherein viscosity of the reaction solution
is greater than that of the ink.

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10. The inkjet recording apparatus according to
claim 5, comprising a coating roller for applying the
reaction solution onto a recording medium.

20 11. The inkjet recording apparatus according to
claim 10, wherein the reaction solution is applied
onto the recording medium in an amount from 0.5 g/m²
to 10 g/m² inclusive.

25 12. An image recording method comprising the
steps of:

coating a recording medium with a reaction

solution capable of destabilizing the dissolved or dispersed state of a coloring material in an ink in contact with the ink containing the coloring material in a dissolved or dispersed state; and

5 coating the ink on the recording medium by an inkjet method,

 wherein the reaction solution contains at least a polyvalent metal ion and a nonionic polymer, K_a value of the reaction solution according to the
10 Bristow method is from $1.3 \text{ mL} \cdot \text{m}^{-2} \cdot \text{msec}^{-1/2}$ to $3.0 \text{ mL} \cdot \text{m}^{-2} \cdot \text{msec}^{-1/2}$ inclusive, and viscosity of the reaction solution is from 20 mPa·s to 150 mPa·s inclusive.

 13. The image recording method according to
15 claim 12, wherein the polyvalent metal ion is contained in an amount from 0.01% to 10% inclusive by weight based on the total amount of the reaction solution.

20 14. The image recording method according to claim 12, wherein pH of the reaction solution is less than 7.

 15. The image recording method according to
25 claim 12, wherein pH of the reaction solution is lower than that of the ink.

16. The image recording method according to claim 12, wherein the viscosity of the reaction solution is greater than that of the ink.

5 17. The image recording method according to claim 12, wherein coating of the reaction solution on the recording medium is carried out by a coating roller.

10 18. The image recording method according to claim 17, wherein the reaction solution is applied onto the recording medium in an amount from 0.5 g/m² to 10 g/m² inclusive.